CDC /NCID
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL CENTER FOR INFECTIOUS DISEASES

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FOCUS

Communicating NCID's prevention and control programs for new and reemerging infectious diseases

Message from the Director

Dear Colleagues:

I'd like to take this opportunity to highlight some of the improved NCID communication capabilities that have been made possible by the work of our Information Resources Management staff.

NCID has made great strides in using the Internet to provide access to E-mail and other CDC resources to staff at U.S. locations outside Atlanta or in other countries. With the implementation of the telecommunication server and the migration to the new E-mail system called Microsoft Exchange, CDC employees in travel status in the United States will have the ability to access resources such as the Mainframe, individual home directory, the CDC Intranet, E-mail, network-specific applications (i.e., JetForms), CDC Request, and much more. Calls can now be made domestically via a toll-free 1-800 number. NCID international travelers will have some of the same benefits and will be able to access CDC resources on the Internet.

The upgrades will provide staff with new, more efficient methods of accessing data while away from headquarters, and we commend the IRM staff for their efforts. For more information on the new technology, contact your network support staff or Rodney Murray, at 404-639-3881.

James M. Hughes

James M. Hughes, M.D.

Focus on Viral and Rickettsial Diseases

CDC team assists in investigation of avian flu outbreak in Hong Kong

During December 1997 and January 1998, a team of CDC scientists, led by Keiji Fukuda, chief, Epidemiology Section, Influenza Branch, Division of Viral and Rickettsial Diseases, joined health officials from the Hong Kong Department of Health in investigating an outbreak of flu caused by a novel strain of influenza A (H5N1). The virus, previously known to infect only birds, caused a cluster of 18 human flu cases, including six deaths, that occurred in Hong Kong from May through December 1997.

"On the basis of ongoing influenza surveillance in Hong Kong and preliminary results from epidemiologic studies, it appears that the outbreak of H5N1 flu has abated," said Nancy Cox, chief, Influenza Branch, Division of Viral and Rickettsial Diseases. "We are continuing to collaborate with Hong Kong health officials on surveillance and various studies related to the outbreak."

CDC first became involved in the Hong Kong investigation in August 1997, when a virus that had been isolated from a 3-year-old boy who died in May of complications of influenza was identified as influenza A(H5N1). After additional suspected cases were detected in November and December, the CDC team

While visiting Hong Kong, HHS Secretary Donna Shalala met with CDC epidemiologists investigating the recent H5N1 flu outbreak. Shown with Secretary Shalala (L-R) are Carolyn Bridges and Keiji Fukuda, Influenza Branch, DVRD; Seymour Williams, National Immunization Program; and Anthony Mounts and Joseph Bresee, Respiratory and Enteric Viruses Branch, DVRD. Other CDC staff who assisted in the Hong Kong investigation were Matt Clarke, Office of the Director, DVRD; Jacqueline Katz, Influenza Branch, DRVD; Laura Conn, Office of the Director, NCID; and Barbara Reynolds, Office of Communication, CDC.

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Avian flu outbreak – continued from page 1

traveled to Hong Kong to assist in an expanded investigation, the goals of which were to identify new cases, determine sources of infection and modes of virus transmission, and identify risk factors for infection with influenza A(H5N1) virus.

The identification of an influenza A virus that is new to the human population initially raised public health concern about the possibility of a pandemic. A pandemic can result from the emergence and sustained person-to-person spread of a novel influenza A virus against which all or most of the human population has no protective immunity, leading to widespread illness and death. However, epidemiologic investigations found that most of the influenza A(H5N1) infections in humans appeared to be acquired directly from chickens and that the virus did not spread easily between humans. No human cases of influenza A(H5N1) have been identified outside of Hong Kong, and no new human cases have been reported anywhere since late December. ■

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Focus on Viral and Rickettsial Diseases

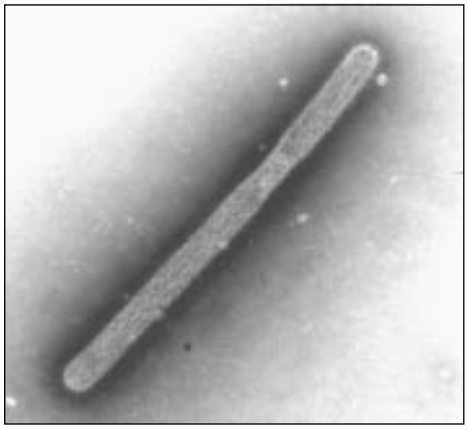
Influenza researchers characterize H5N1 virus

A team of NCID scientists and colleagues has identified key genetic features of a novel avian influenza A(H5N1) virus that may help explain how the virus causes severe illness in birds and humans. The team, led by researchers from the Influenza Branch, Division of Viral and Rickettsial Diseases, reported its findings in the January 16 issue of *Science.*

According to DVRD Director Brian Mahy, "The report confirms the avian origin of this virus and provides important clues about its virulence. These findings demonstrate the critical role of molecular biology research in the modern public health system and in our continuing efforts to address the threat of emerging infections."

To characterize the virus, which was isolated from the first identified patient with influenza A(H5N1) in May 1997, the team analyzed the sequence of genes that code for the viral surface proteins and other portions of the viral genome. Their results showed that all eight viral RNA segments were derived from an avian influenza strain, with no evidence of mixing (or reassortment) with genes of influenza A viruses known to circulate recently among humans.

The team also found evidence of a hemagglutinin protein cleavage site that is characteristic of highly



Negative-stain electron micrograph of influenza A(H5N1) virus (courtesy of Jacqueline Katz and Cynthia Goldsmith, DVRD).

pathogenic avian viruses and that in birds is believed to enable the virus to spread systemically from the respiratory tract to other sites, including the heart, brain, and blood vessels. Studies are under way to examine more precisely how this H5 virus infects human cells and to determine if other H5 strains are circulating in the human population.

Authors of the *Science* article are Kanta Subbarao, Alexander Klimov, Jacqueline Katz, Henrietta Hall, Catherine Bender, Mark Hemphill, Thomas Rowe, Michael Shaw, Xiyan Xu, Keiji Fukuda, and Nancy Cox of NCID's Influenza Branch, and researchers from Queen Mary Hospital, Hong Kong, and the U.S. Department of Agriculture, Athens, Georgia. ■

Focus on Parasitic Diseases

Parasitic Disease Drug Service provides "orphan" drugs to treat rare infections

Although domestic outbreaks of parasitic diseases such as cryptosporidiosis, giardiasis, and most recently, cyclosporiasis, have arisen, many serious parasitic infections are rare in the United States, occurring primarily among international travelers and immigrants. Many of the drugs critical for the treatment of these patients are not licensed for use in the United States. These so-called "orphan" drugs are judged to be unprofitable by the U.S. pharmaceutical industry because of marketing and regulatory factors.

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Orphan drugs – continued from page 2

In 1967, the Parasitic Disease Drug Service (PDDS) was established. Now an effort of the Division of Parasitic Diseases (DPD) and the Scientific Resources Program (SRP), the PDDS provides essential antiparasitic agents to more than 100 patients each year.

Anne Moore, DPD, is chief of the PDDS; pharmacists are John Becher and Cindy Dougherty, SRP. Each drug on the PDDS formulary is distributed under an "investigational new drug" (IND) protocol, with CDC as a sponsor. When a U.S. physician needs one of the PDDS drugs for treatment, he or she contacts CDC.

PHOTO: Mary Bartlett

PDDS staff (L-R): Jackie Roberts, Anne Moore, John Becher, Cindy Dougherty.

DPD's duty officer reviews the case and registers the physician as a coinvestigator. SRP prepares and ships the drug and sends information that includes a patient consent form and other report forms on safety and efficacy, which are filled out and sent to DPD. DPD duty officers help manage the case, and sometimes a DPD EIS Officer and a supervisor are sent to help administer treatment (this is usually done when melarsoprol is used to treat African trypanosomiasis). PDDS follow the rules of the CDC Institutional Review Board. DPD files an annual summary on each drug with the FDA compiled from the clinical reports from investigators. In 1997, with the aid of Emerging Infectious Diseases funding, PDDS updated its computerized database, which allows both DPD and SRP to access both drug distribution and clinical safety and efficacy data. This multiuser program, written by DPD's Jackie Roberts, allows the data required to monitor these investigational protocols to be accessed more easily, thus helping the staff to produce accurate and timely FDA reports. It also provides flexibility so that other drugs, beyond parasitic disease agents, could be added.

In addition to meeting an important public health need, information derived from this service is valuable in assessing treatment of tropical diseases when there is no opportunity for reinfection and in maintaining surveillance of "exotic" diseases in this country. The utility of PDDS for emerging infectious diseases surveillance was proven in 1981, when one of the early signals of the AIDS epidemic was an increased demand for pentamidine to treat *Pneumocystis carinii* pneumonia in patients with an "unspecified immunodeficiency." More recently, in responding to emergency shortages of sulfadiazine, the PDDS provided a flexible mechanism that served the emergency needs of the nation as well as provided a unique surveillance mechanism for temporarily monitoring the incidence of *Toxoplasma* encephalitis in AIDS patients.

In recent years, PDDS has provided bithionol for treatment of fascioliasis and paragonimiasis, dehydroemetine for invasive amebiasis, diloxanide furoate for certain cases of asymptomatic amebiasis, melarsoprol and suramin for African trypanosomiasis, nifurtimox for American trypanosomiasis (Chagas disease), pentostam for leishmaniasis, and ivermectin for onchocerciasis. ■

IDEA Place

Arkansas talks about infectious diseases

"When Sir Alexander Fleming discovered a penicillin-producing mold in 1928, he opened the door to the development of antibiotics. Antibiotics could do what no other medication could—cure infections and infectious diseases." So begins "The Fight Is On To Keep Antibiotics Strong," one article in the Arkansas Department of Health's series on infectious diseases. The articles, appear in a newspaper column called "Keeping Your Home-town Healthy." Other subjects in the series deal with adult immunizations, food safety, flu shots, and handwashing.

Each article is prepared in news release format and provides scientific background as well as Arkansas-specific data. For example, the immunization article lauds the counties for progress toward meeting the Year 2000 childhood immunization goals, but also tells why adults, especially those who are over age 65 or immune-compromised, also need to be immunized. The food safety issue explains how *Salmonella* and *Escherichia coli* O157:H7 infections are spread and gives clear consumer tips for safe food handling and methods of prevention.

The department has also developed a video for public broadcast. Its messages on antibiotics, handwashing, and food safety reinforce the newspaper column and relevant articles. The video can also be used in other health education settings. To request copies of the tape or articles, contact Barbara Hager, Director, Division of Health Education and Promotion, Arkansas Department of Health, 501-661-2495.

Lela Folkers
Office of Health Communication, NCID

Focus on AIDS, STD, and TB Laboratory Research

Working groups develop policies on xenotransplantation

Xenotransplantation is the transplantation of living cells, tissues, or organs between different animal species. Because of the growing disparity between the availability of human donor organs and the number of potential transplant recipients, interest in xenotransplantation from animals to humans has increased in both the medical and patient communities. Examples of current efforts in xenotransplantation include the use of porcine hepatocyte preparations as biologic dialysis machines for persons with catastrophic liver failure for whom no appropriate human liver is available, treatment of Parkinson's disease through transplantation of fetal porcine tissue, and implantation of functioning porcine pancreatic islet cells as an attempted cure for diabetes.

The National Institutes of Health (NIH), the Food and Drug Administration (FDA), the Health Resources and Services Administration (HRSA), and CDC share responsibilities for the development of U.S. policy and resolution of issues surrounding xenotransplantation. At NCID two working groups have been involved with the transplant community and the other DHHS agencies to develop such a policy. The CDC Xenotransplantation Policy Working Group is led by Louisa Chapman of the Division of AIDS, STD, and TB Laboratory Research (DASTLR) and includes Tom Folks, Sal Butera, and Tom Spira, DASTLR; Jim Ebert, Bill Reeves, and Chuck Rupprecht, Division of Viral and Rickettsial Diseases; Bobby Brown, formerly of Scientific Resources Program; Mack Powell, Division of Parasitic Diseases; Michele Pearson, Hospital Infections Program; and Rick Spiegel, Division of Bacterial and Mycotic Diseases. The CDC Xenotransplantation Laboratory Working Group is led by Walid Heneine and includes Tom Folks, Bill Switzer, Paul Sandstrom, Louisa Chapman, Sal Butera, and EID fellows Jennifer Brown and Aprille Matthews, all of DASTLR.

A major accomplishment in this area was the development of draft PHS guidelines on Infectious Disease Issues in Xenotransplantation which were published last year in the *Federal Register*. In addition, CDC continues to work with the other DHHS agencies on the development of a National Xenotransplantation Registry to conduct public health surveillance for xenogeneic infections and other adverse outcomes among xenograft recipients. On January 21-22, FDA, NIH, HRSA, and CDC sponsored a meeting in Bethesda to further address these issues and to clarify the specific public health mechanisms necessary to implement such a policy.

CDC Xenotransplantation Working Group. Back row (L-R): Mack Powell, Tom Spira, Paul Sandstrom, Tom Folks, Jim Ebert, Sal Butera. Front row (L-R): Louisa Chapman, Jennifer Brown, Michele Pearson, Walid Heneine, Aprille Matthews, and Bill Switzer. Not pictured: Bobby Brown, Bill Reeves, Chuck Rupprecht, Rick Spiegel.

Although xenotransplantation offers promising hope for persons requiring transplants, it also raises many complex issues and concerns. The genesis of the AIDS epidemic is increasingly presumed to have been the adaptation and transmission of simian viruses to humans. Both baboons and pigs, the primary animal species considered as sources of xenotransplants for humans, are known to harbor retroviruses and other persistent infectious agents. CDC's primary role in these efforts is to determine the risks involved in such procedures and to address any threats to public health such as the possibility of transmission of infectious diseases harbored by animals to humans. CDC is developing diagnostic assays and approaches to make laboratory-based surveillance possible for selected organisms present in xenotransplants from baboons and pigs. CDC has also developed diagnostic assays for the presence of porcine and baboon cells, assays for the presence of endogenous and exogenous retroviruses from baboons and pigs, and extremely sensitive assays for the generic detection of retroviruses. In addition, collaborations have been initiated with more than seven clinical centers in the United States, Canada, and Europe to apply these assays to recipients of such xenotransplants. ■

Focus on Quarantine

Quarantine officers at ports of entry protect the public

Traditionally, NCID's prevention mission is thought of in terms of surveillance, epidemic investigations, and epidemiologic and laboratory research. For the Division of Quarantine (DQ) staff in eight quarantine stations, the prevention mandate includes such action verbs as "inspect," "apprehend," "seize," and "destroy." The personnel in the quarantine stations at times act as NCID's enforcement arm to prevent the introduction, transmission, and spread of communicable diseases from other countries into the United States. As befits their enforcement authority, quarantine officers wear their uniforms every day.

Quarantine stations are located at the international airports in New York, Chicago, Miami, Atlanta, Los Angeles, San Francisco, Seattle, and Honolulu. Each quarantine station has responsibility for all items (and persons) of public health significance entering the country through the land border ports, seaports, and international airports in its assigned region. The staff also assists with epidemic investigations on cruise ships. Recent investigations involved rubella and influenza outbreaks; a major part of controlling the problems involved vaccinating the ships' crews to prevent transmission of disease to each other and to new groups of passengers.

The quarantine stations are notified of ill passengers arriving on international flights so that these flights can be met and necessary prevention measures taken. In 1996, of 40 million international travelers who arrived at U.S. ports of entry, 1,008 were identified as being ill upon arrival. Of these ill passengers, 95 met the definition of "ill person" in the Foreign Quarantine Regulations, that is, a quarantinable disease was suspected. For example, the Seattle Quarantine Station was notified recently of a passenger arriving from Korea with drug-resistant infectious tuberculosis. Concerned about transmission to crew and other passengers, Officer-in-Charge Jenny Ansdell acted promptly to coordinate an exchange of information among the airline, the Immigration and Naturalization Service, and the TB Control Coordinator of the State Health Department. Atlanta Officer-in-Charge Terrence Daley vividly recalls a passenger from Sierra Leone with fever, chills, and headache, whose arrival coincided with an outbreak of Lassa fever in that country. The passenger, who was placed in isolation and transported to a hospital, proved to have *Plasmodium falciparum* malaria rather than a viral hemorrhagic fever. This arrival led to well-attended training for gate agents and supervisors on recognizing illnesses and taking appropriate steps to minimize exposure.

In addition, quarantine officers screen immigrants and refugees arriving at U.S. ports of entry for evidence of medical conditions that would exclude them from entry into the United States under provisions of the Immigration and Nationality Act (e.g., HIV, tuberculosis, Hansen's disease, and certain sexually transmitted diseases). In 1996, 348,252 immigrants and 79,068 refugees entered the United States; each was required to present evidence of a medical examination documenting the absence of any excludable condition.

The quarantine stations also screen for other items that have public health significance. They inspect—and occasionally confiscate or deny entry to—shipments of live animals. Primates are of special concern because they are associated with transmission of many diseases to humans, some of them potentially fatal.

Inspector Sena Blumensaadt of the Chicago Quarantine Station recalls two recent incidents involving monkeys: one living and exceedingly active, the other deceased and imported as a food item. She confiscated both. The former was promptly returned to Jordan; the latter was incinerated, along with other food items it may have contaminated.

Another recent event described by Inspector Blumensaadt illustrates the quarantine stations' responsibility for maintaining and delivering certain rarely needed, but important, drugs. Expediting the delivery of a vial of botulism antitoxin to a hospital in Rockford, Illinois, involved a high-speed ride with the Chicago police to meet a helicopter, which was waiting to transport the lifesaving package. ■

Quarantine officers get ready to inspect a nonhuman primate shipment, Chicago.

Partners in Prevention

Emerging Infectious Diseases (EID) Laboratory Fellowship Program

The Emerging Infectious Diseases (EID) Laboratory Fellowship program is a partnership between CDC and the Association of State and Territorial Public Health Laboratory Directors (ASTPHLD). Initiated in January 1996, the program is designed to recruit and train laboratory scientists for careers in public health. The fellowship comprises two training programs, a 1-year Training Fellowship designed for master's and bachelor's level scientists with emphasis on the practical application of technologies, methods, and practices related to emerging infectious diseases; and a 2-year Research Fellowship for doctoral level (Ph.D., M.D., D.V.M.) scientists with emphasis on research or development in infectious diseases. Since its inception, three classes totaling 45 fellows (36 training and 9 research) have been recruited into the program and assigned to CDC or state laboratories.

The most recent class of 20 fellows (15 training and 5 research) began their assignments in October 1997. Fifteen went to CDC laboratories in Atlanta, Fort Collins, Colorado, and Anchorage, Alaska, and 5 were assigned to state health department laboratories.

EID Fellows participate in important projects during their assignments. Examples include development of laboratory procedures such as establishment of a dengue MAC-ELISA procedure; validation of pulsed-field gel electrophoresis (PFGE) as a tool for investigation of nosocomial enterococcal disease outbreaks; development of a human herpesvirus (HHV) H6 and H7 IgM assay; testing of the efficacy of an experimental influenza-special antiviral agent; evaluation of methods for improved diagnosis of *Chlamydia trachomatis* infection; development of a polymerase chain reaction (PCR) assay for detecting *Mycoplasma pneumoniae* in respiratory specimens; and research on the role of tick feeding in modulation of host immunity of *Borrelia burgdorferi*, the causative agent of Lyme disease. One fellow successfully isolated simian foamy virus from an occupationally exposed primate worker.

Back row (L-R): Jon Tongren, Daphne Moffett (Environmental Health Fellow), Jennifer Ekmark, Sophie Newland, Charles Schable (Orientation coordinator), Angela James, Doug Drabkowski (ASTPHLD Coordinator), Jennifer Rak; Middle row (L-R): Debbie Deppe (CDC Project Officer), Michael James, Karen Birkhead, Jennifer Cashdollar, Kelly Kamm, Lynn Lucher, Lynn Cooper, Amy Kirby, Cynthia Carlyn; Front row (L-R): Kara Warden, Lynn Garbel, Juliana Grant, Aprille Matthews, Thuy Le, Leslie Wolf, and Katherine Morrison.

Fellows have also worked together with epidemiologists in numerous outbreak investigations. One fellow recently returned from Kenya investigating an outbreak of Rift Valley fever and hemorrhagic disease; another spent time in the Los Angeles area investigating a community outbreak of legionellosis. Fellows have traveled overseas to participate in various research or training opportunities: for example, a WHO project on surveillance of pneumonia in children in Uzbekestan and Kazakhstan (January 1997); a *Cyclospora* investigation in Leogane, Haiti; and a study of dengue and malaria in Iquitos, Peru, with the U.S. Army Medical Research Institute of Infectious Diseases. Fellows have contributed to numerous publications in peer-reviewed journals and made presentations at national and regional meetings.

The success of the EID Fellowship program will be partly measured by the achievements of EID Fellows during their fellowship program, and perhaps more importantly, their future placements supporting public health laboratory practices. Among the early graduates, all have retained jobs in public health laboratories or entered postgraduate studies. One graduate, Dr. Debra Horensky, is chief of the Biological Sciences Division for the state of New Mexico, and another, Dr. Laura Povinelli, recently accepted the position of assistant director, Division of Communicable Diseases, Wisconsin Department of Health. ■

Focus on Hospital Infections

Hospital Infections Program collaborating in nationwide study of bacterial contamination of blood products

The Hospital Infections Program (HIP), American Association of Blood Banks (AABB), American Red Cross (ARC), and U.S. Department of Defense (DoD) have initiated a nationwide study (the BaCon Study) to assess the frequency of bacterial contamination of blood products associated with transfusion reactions.

Matthew Kuehnert, EIS, is heading HIP's role in the collaborative effort, which began in December 1997.

Although bacterial contamination of blood products can be an important cause of transfusion reaction, with potentially lethal results, clinicians often have a low suspicion of blood contamination as a cause of reactions, and therefore appropriate testing for contamination is not performed.

Matthew Kuehnert

To heighten awareness and determine the frequency and severity of such episodes, HIP, AABB, ARC, and DoD will work with blood collection facilities, hospitals, blood banks, and clinicians to improve the detection and reporting of transfusion reactions caused by bacterial contamination of blood products.

"We've developed materials that will assist in educating hospital personnel, improve surveillance reporting, and encourage proper work-up of episodes of transfusion reaction that may be due to bacterial contamination of blood products," Dr. Kuehnert said.

In addition, the results of this study will help to standardize criteria for detection of bacterial contamination and facilitate treatment of transfusion reaction caused by such contamination. ■

NEWS BRIEFS

APIC establishes fellowship in Hospital Infections Program

The Association for Professionals in Infection Control and Epidemiology (APIC) has established a visiting fellowship program in the Hospital Infections Program (HIP). Through this fellowship, all APIC members will be eligible to apply for 1 year of training at HIP in health care epidemiology and infection control. The APIC Board has approved funding for this fellowship for 4 years with the intent to make this an ongoing program. The first APIC-HIP fellow, to begin in FY98, will conduct research to determine optimal infection control staffing levels for U.S. health care facilities.

Virus Encounters wins award

Virus Encounters: Microorganisms and the Human Body, a live electronic field trip to CDC in Atlanta, hosted by Bob Howard and other NCID staff, was awarded first place for the 1997 Best Distance Learning Program K-12 at the TelCon Awards Ceremony, sponsored in part by the United States Distance Learning Association, in Anaheim, California, in November 1997. *Virus Encounters* (produced by Turner Learning, Inc.) was the educational component to the 4-hour documentary *The Coming Plague*, which aired on the TBS Superstation program Destination Sunday last April. For more information on Turner Learning materials, educators may call 1-800-344-6269.

News Makers

Staff Changes

Bobby Brown, former chief of the Animal Resources Branch, SRP, has taken a position with the National Institutes of Health.

Joanna Buffington has joined the Hepatitis Branch, DVRD, as a medical epidemiologist. She previously served as acting chief of the EIS Program, Epidemiology Program Office.

Connie Dorner has been named chief of Biometrics Activity in DVRD. She comes to DVRD from IRMO, where for 16 years she served in a variety of computer and technical support positions.

Sharon Hudson has joined the Dengue Branch of DVBID, in San Juan, PR, as a behavioral scientist. She comes to CDC from the University of Southern California, where she was completing her doctoral degree.

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News makers – continued from page 7

Yvonne Johnson, administrative operations assistant in OAS, joined DVRD in February.

Greg Jones, OAD, has joined OD as an emergency response specialist.

Ethleen Lloyd, chief, Health Education and Prevention Unit, Special Pathogens Branch, DVRD, has accepted a position in the National Center for HIV, STD, and TB Prevention. She begins a new assignment in eastern Africa in March.

Timothy Morken has joined the Infectious Disease Pathology Activity in DVRD as a medical technologist. He comes to DVRD from the King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia.

Lawrence Schonberger, Assistant Director for Public Health, DVRD, will serve a 1-year appointment as president of the American Epidemiological Society, beginning in March.

Ed Snow has been named deputy director of the Scientific Resources Program. Previously, he served as chief of the Technical Services Branch, SRP.

Abbas Vafai has been named chief of the Biological Products Branch, SRP. Before joining SRP, he was an associate professor of microbiology at the University of Illinois, College of Medicine, at Rockford.

Kathleen Veilleux has joined the Special Pathogens Branch, DVRD, as a microbiologist. She was previously with a private sector company.

Retirements

Walter Bond, chief, Hospital Environment Laboratory Branch, HIP, retired on January 2, after 30 years of government service.

Peggy Hayes, program specialist, Animal Resources Branch, Scientific Resources Program, retired in January after 31 1/2 years at CDC.

Anita Highsmith, chief, SRP Water Quality Laboratory, retired on January 31, after 30 years of government service.

Peggy Shoemaker, program specialist, OAS, retired on January 2, after 17 years at CDC.

INSIDE

Harold Van Patten, assistant director for management and operations, DASTLR, retired on January 2, after 33 years of service.

George Wiggett, biology laboratory technician, Arbovirus Diseases Branch, DVRD, retired on January 2, after 42 years at CDC.

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